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UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

Pacific Northwest Forest and Range Experiment Station.

Portland, Oregon July 1, 1938.

THE FOREST SURVEY OF THE DOUGLAS FIR REGION.

Explanatory Test to Accompany Forest Statistics
For Western Oregon and Western Washington Counties.

CALIFORNIA FOREST & RANGE EXPERIMENT STATION

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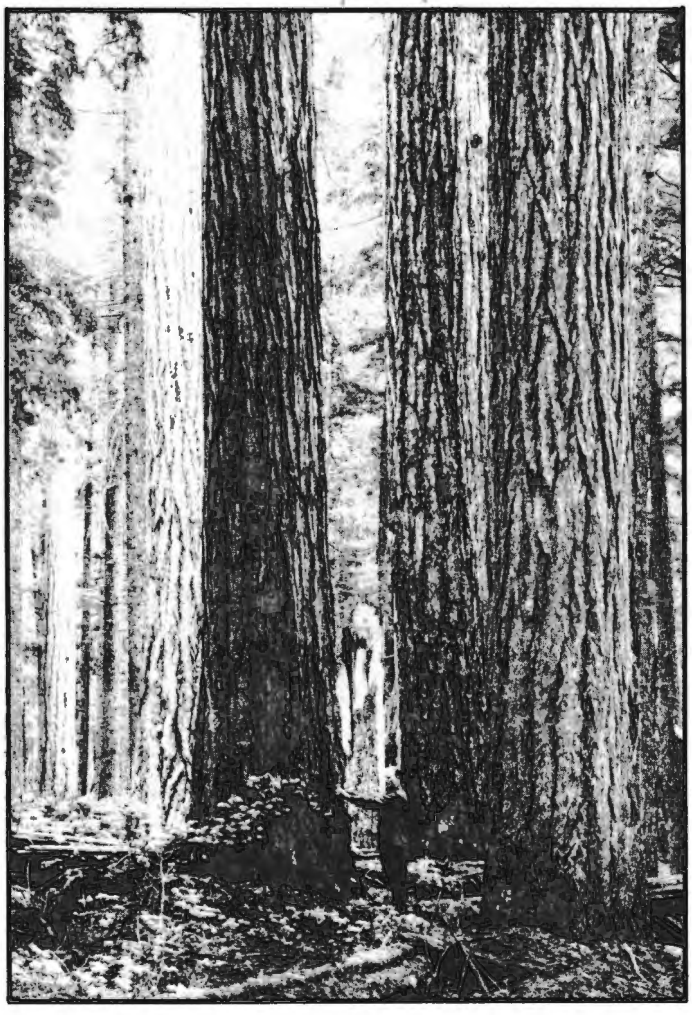
THE FOREST SURVEY
OF
THE DOUGLAS FIR REGION

EXPLANATORY TEXT TO ACCOMPANY FOREST STATISTICS FOR WESTERN OREGON AND WESTERN WASHINGTON COUNTIES

Forest survey report no. 1 Rev.



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PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION
U. S. COURT HOUSE PORTLAND, OREGON

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JULY 1, 1938

CALIFORNIA FOREST & RANGE EXPERIMENT STATION
330 GIANNINI HALL, UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

Portland, Oregon July 1, 1938

THE FOREST SURVEY OF THE DOUGLAS FIR REGION
Conducted by the Pacific Northwest Forest and Range Experiment Station

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Explanatory Text to Accompany Forest Statistics for Western Oregon and Western Washington Counties

A forest survey of the United States was authorized in Section 9 of the McSweeney-McNary Forest Research Act of 1928. This survey is a comprehensive and detailed investigation of (1) the existing timber resources by volume and area; (2) the drain upon the Nation's forests through cutting and through loss by fires, insects, and disease; (3) current and potential growth on forest areas; and (4) the present and prospective wood requirements of the Nation. Finally, it involves the interpretation of these classes of factual information in their relation to each other and as related to other economic factors and trends. The objective of this survey is thus to supply a basis for meeting adequately the needs for forest benefits, as well as for sound planning for use of forest land, nationally, regionally, and locally, by public and private agencies.

The Pacific Northwest Forest Experiment Station was designated to make the forest survey of Oregon and Washington. Work was begun in 1930 in the region west of the summit of the Cascade Range, the so-called Douglas fir region. The inventory phase of the forest survey for that portion of the two States was completed in 1933.

In the fall of 1937 the work of keeping the forest inventory data current was begun. During that year data for two counties, Clatsop County, Oregon, and Grays Harbor County, Washington, were revised by field examination and new inventories compiled early in 1938. Field work is planned for four or five counties in 1938. If this phase of the forest survey is continued, it is tentatively planned to reinventory each county in the region in which depletion by cutting or fire has made significant changes in forest conditions once during approximately a 5-year period; work in other counties in which depletion has been less rapid will be deferred until justified. The western Oregon and western Washington counties, in which depletion has been large, will be revised in order of the degree of change in type acreage and saw-timber volume since the original field work.

Tables and graphs presenting in condensed form the essential basic facts relating to volume of timber and acreage of forest cover types have been issued for each county in the region. As each county is reworked it is planned to issue revised forest statistics accompanied by a brief textual discussion of the changes in the county's forest resources and an analysis of the present situation. Lithographed State type maps and blueline print county type maps have been published for the entire region and as each county is reworked a revised county type map will be published.

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Growth data have been presented by counties and for the region as a whole based on the original inventory statistics in Forest Research Notes No. 20, "Forest Growth in the Douglas Fir Region." It is not believed practicable to revise the growth data at the same time as the inventory but it is planned to recompute growth at the expiration of each decade.

Explanation of Methods and Terms

Sources of Data - In the survey of Oregon and Washington all existing information on the distribution of forest types and estimates of volume of timber, as well as existing maps and timber estimates of public agencies, including county cruises, was used as far as possible. Timber estimates of private lands were furnished by the owners, with the proviso that they be published only in combination with the cruises of other owners and for large areas. This cooperation of timber owners was a very material aid to the project. Such existing estimates as were available were thoroughly checked in the field by a corps of timber experts who determined adjustment factors by which to raise or lower existing estimates to the standard adopted by the forest survey. Some 165,000 acres in western Oregon and western Washington were intensively check-cruised to adjust the cruise on areas for which there were existing usable data. Volumes of merchantable timber outside the boundaries of the national forests were obtained largely by this method. Inside the boundaries of the national forests sufficiently detailed volume and type data were available for only a small proportion of the merchantable timber area.

Where no usable data existed, either inside or outside the national forests, the field personnel carried on type mapping and estimating, thus giving a complete coverage of the forest area of the region. Where there were large blocks of farm land sprinkled with forest areas too small to map in place, the field examiner ran strips at stated intervals to arrive at a statistical evaluation of the proportion of the several forest types in the farm area and the timber volume thereon.

Timber Estimating Standards - The timber estimates in the following tables are expressed in board feet, log scale, according to the Scribner rule. All survey cruising, whether for adjustment purposes or for areas not covered by existing estimates, was done to include all trees of the following minimum specifications: all coniferous trees which would make one 32-foot log 12 inches in diameter inside bark at the small end and all hardwood trees which would make one 8-foot log 10 inches in diameter inside bark at the small end.

Allowance has been made in these estimates for decay, defects, and such breakage as is inevitable in exploitation. In other words, the estimates are for the net volume usable in saw-timber operations practicing intensive utilization. The standards of utilization employed in the survey are probably slightly more intensive for the more valuable species and

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considerably so for the less valuable species than the average utilization practice of the present day saw-timber operator, owing largely to the inclusion of trees as small as 16 inches in d.b.h.

Differences between present estimates and previous estimates do not necessarily indicate increases or decreases in the volume of known timber in the county. Such differences may be due in large measure to differences in standards between the present and previous cruises and to variation in the completeness of the cruise. The present estimates cover all forest trees of the above specifications, outside of municipalities, whether in small farm woodlots or in extensive forest areas.

The estimates as herein given make no distinction with regard to accessibility or availability to market, although it is recognized that in some counties some of the timber is utterly remote and some readily accessible. Neither is there any differentiation by classes of forest products, the whole volume above the stated limits being expressed in board feet of saw timber. In the statistics and textual analysis of the units larger than a county, these further subdivisions of the estimates will be considered.

Ownership Classes - The volume of timber and the acreage of forest types have been compiled by ownership classes from the best public records available. It is of course recognized that ownership is constantly changing. The totals of each ownership class will in many cases not coincide with statistics from other sources; nor in fact will the total area of the county always agree with hitherto accepted total areas. The statistics herein presented are believed to be the most accurate obtainable at the date of record. The following ownership classes were used:

Private - All privately owned forest property, including farm woodlots.

State, available for cutting - Includes any State-owned forest property which is not reserved from cutting.

State, reserved from cutting - Includes parks, national guard campgrounds, etc.

County - Includes forest property deeded to the county. Tax delinquent land not deeded to the county is classified as "private."

Municipal - Includes all municipally owned forest property outside the platted limits of municipalities, such as city watersheds, etc.

Indian - Includes both tribal and trust allotments.

Revested land grants - Includes O. and C. and other land grants which have reverted to Federal ownership, whether

classified as "timber", "agricultural", or "power withdrawals."

Federal other than national forest, Indian, and revested land grants, available for cutting - Includes vacant lands not revested and miscellaneous.

Federal other than national forest, Indian, and revested land grants, reserved from cutting - Includes national parks, national monuments, military reservations, and lighthouse reservations.

National forest, available for cutting.

National forest, reserved from cutting.

The term "reserved from cutting" as applied to State, national forest, or other Federal land, denotes that the timber, because of statute, proclamation, or policy, is not available for cutting, the land usually being officially dedicated to park, watershed or other uses to the exclusion of timber cutting. The term "available for cutting", in contrast to the above, means that there is no legal or formal prohibition on timber cutting.

Age Classes and Degrees of Stocking - In addition to typing according to composition and size, the important immature forest types--those where most of the dominant trees are less than 20 inches in diameter (or 24 inches in the case of cedar and spruce)--were classified according to age in 10-year classes and according to their density in three degrees of stocking. The age and stocking classification for these immature stands is shown in table 4. If a forest of seedlings, saplings, or small "second growth" is dense enough to cover 70 to 100 percent of the area (as measured by the stocked-quadrat method), it is classified as "well stocked"; if 40 to 69 percent is covered, it is called "medium stocked"; if 10 to 39 percent, it is "poorly stocked." Areas that show less than 10 percent stocked are considered as "nonrestocking."

In the original inventory, 1930 to 1933, the type "recent cutover" (No. 36) was assigned to clear-cut areas logged subsequent to January 1, 1920. No distinction between stocked and nonstocked land was made since it was considered impracticable to classify and type map the degree of regeneration on land cut as recently as 1920 and later. However, some of the areas cut between 1920 and 1923, inclusive, were examined and a statistical expression of their degree of stocking obtained. Results of this examination are analyzed in the regional report. In the "revision" inventory type 36 is assigned to clear-cut areas logged subsequent to January 1, 1930. Likewise, no distinction is made between stocked and nonstocked land.

Tree Species - The timber estimates have been kept separately for all the tree species that usually reach saw-timber size and character. The absence of volume estimates for any species in table 1 does not nec-

essarily mean that the species does not occur in the county in question; a species may be present but not have been found in significant quantity or in trees of commercial size, or it may be confined to the noncommercial types. This is particularly true of such species as yew and the hardwoods that often do not attain saw-timber specifications. The common names employed by the Forest Service (U.S.D.A. Misc. Cir. 92) have been used throughout.

Definition of Terms - The abbreviation "d.b.h." signifies the diameter at breast height (4½ feet above ground) outside the bark.

In describing Douglas fir timber the terms "old growth" and "second growth" should be regarded as relative descriptive terms to distinguish the older, more mature timber from the younger and more rapid growing timber. There is no sharp line of demarcation between the two. Likewise the terms "large" and "small" are relative and are used to divide the large, older Sitka spruce, hemlock, etc., from the smaller and younger timber of these types or species.

Definition of Forest Cover Types

The forest cover types recognized by the forest survey in the Douglas fir region of western Oregon and western Washington are defined below. Not all of these thirty-eight types are found in any one county.

Nonforest Types

2. Barrens: An area too rocky, too soilless, or too exposed to support a vegetative cover of either trees, shrubs, or herbs.

   Grass, Sagebrush, and Brush: Areas whose principal present vegetation is either grass, herbs, brush, shrubs, or sagebrush (where not part of operating farm units).

   Cities, towns, and unmeandered water surface.

3. Cultivated: An area cleared and/or cultivated for agricultural use, including pasture.

   Stump pasture: Logged-off or burned-off land, part of operating farm units, now chiefly devoted to grazing and from which the stumps or snags have not been removed. Usually some attempt has been made to propagate forage plants by seeding or repeated burning.

Woodland Types

4. Oak-Madrone: A forest composed of approximately 60 percent or more of any species of oaks (including tan oak) or madrone or any combination of these. No separation of age classes.

5. Juniper: A forest composed of 80 percent or more of any species of juniper.

5½. Ponderosa pine woodland: Areas in which ponderosa pine predominates, with the trees scattered, either singly or in clumps, forming a very thin stand--individual trees may or may not be of merchantable size and form.

Timberland Types

Douglas fir: A forest containing approximately 60 percent or more by volume of Douglas fir--the characteristic forest west of the Cascades. The type is divided into size classes as follows:

6. Douglas fir, large old growth: Forests where the major part of the volume is in trees more than 40 inches in d.b.h.

7. Douglas fir, small old growth: Forests where the major part of the volume is in trees 22 to 40 inches in d.b.h.

8. Douglas fir, large second growth: Forests where the majority of the volume is in trees 22 to 40 inches in d.b.h. Young growth, coarse grained timber that will cut only a small percent of the upper grades of lumber.

9. Douglas fir, small second growth: Forests in which most of the volume is in trees 6 to 20 inches in d.b.h.

10. Douglas fir seedlings and saplings: Forests in which most of the trees are less than 6 inches in d.b.h.

Sitka spruce: A forest containing 50 percent or more by volume of Sitka spruce, rarely in pure stands, usually in mixture with Douglas fir, western hemlock, or western red cedar. Three size classes will be recognized:

11. Sitka spruce, large: Forests of saw-timber size in which most of the volume is in trees more than 24 inches in d.b.h.

12. Sitka spruce, small: Forests in which most of the volume is in trees from 6 to 24 inches in d.b.h.

13. Sitka spruce seedlings and saplings: Forests in which most of the dominant trees are less than 6 inches in d.b.h.

Western hemlock: A forest in which 50 percent or more of the volume is western hemlock with a variable amount of Douglas fir, western red cedar, silver fir, and Sitka spruce. Three size classes will be recognized:

14. Western hemlock, large: A forest of saw-timber size in which most of the volume is in trees more than 20 inches in d.b.h.

15. Western hemlock, small: Forests in which most of the volume is in trees from 6 to 20 inches in d.b.h.

16. Western hemlock seedlings and saplings: Forests in which most of the dominant trees are less than 6 inches in d.b.h.

17. Western red cedar, large: A forest of saw-timber size containing approximately 40 percent or more by volume of western red cedar, in which most of the volume is in trees more than 24 inches in d.b.h.

18. Port Orford cedar, large: Forests of saw-timber size in which 20 percent or more of the volume is in Port Orford cedar trees more than 30 inches in d.b.h. with a variable amount of Douglas fir, white fir, Sitka spruce, western red cedar, and hardwoods.

19. Cedar, small: Forests where small or immature western red cedar 24 inches in d.b.h. or less or Port Orford cedar 30 inches in d.b.h. or less, together or either one of them, comprise 40 percent or more of the dominant stand by volume. May include considerable western hemlock or Sitka spruce.

Ponderosa pine: A forest containing approximately 50 percent or more by volume of ponderosa pine, sugar pine, or Jeffrey pine, or all of them in combination. This type is divided into three size classes:

20. Ponderosa pine, large: Forests where the predominating trees are more than about 22 inches in d.b.h. (more than about 150 or 200 years old), so-called "yellow pine", and where no material amount of the stand has ever been cut.

20A. Sugar pine, large: A forest containing 20 percent or more by volume of sugar pine, never in pure stands, usually in mixture with Douglas fir, ponderosa pine, or white fir, in which most of the volume is in trees more than 22 inches in d.b.h. This type was mapped only outside the boundaries of national forests.

21. Ponderosa pine, small: Forests where the majority of the trees are under about 22 inches in diameter (under 150 or 200 years of age, so-called bull pine), either on old burns or on areas which have been selectively cut, and where the volume in trees 12 inches or more in d.b.h. is ordinarily at least 1,000 bd. ft. per acre.

22. Ponderosa pine seedlings, saplings, and poles: Forests on old burns or heavily cut logged-off land where the majority of the trees are less than 12 inches in d.b.h. and the stand of larger trees, if any, amounts to less than 1,000 bd. ft. of saw timber per acre.

Fir-Mountain hemlock: Forests, characteristic of the upper slopes of the Cascade Range, the coast mountains in Oregon and the Olympics in Washington, in which either noble fir, silver fir, Shasta red fir, or mountain hemlock, or any combination of these species, comprise at least 50 percent of the volume of the stand. Two size classes are recognized:

23. Fir-Mountain hemlock, large: Forests where a majority of the dominant trees are 16 inches in d.b.h. or more and physically suitable for saw timber. (Mature stands not suitable for saw timber ordinarily included in the subalpine type.)

24. Fir-Mountain hemlock, small: Forests where most of the dominant trees are less than 16 inches in d.b.h., usually young trees on old burns or cuttings.

Lodgepole pine: A forest containing at least 50 percent by volume of lodgepole or knobcone pine, often almost pure. This type is divided into two size classes:

25. Lodgepole pine, large: Forests where 50 percent or more of the dominant trees are 12 inches or more in d.b.h.

26. Lodgepole pine, small: Forests in which less than 50 percent of the dominant trees are as large as 12 inches in d.b.h.

White fir-larch-Douglas fir: A mixed forest limited to the range of western larch consisting of western larch, white fir, Douglas fir, ponderosa pine, and lodgepole pine, in which ponderosa pine constitutes not more than 40 percent of the stand. The composition of this type varies greatly. Prevalent on the north and other cool slopes within the ponderosa pine zone. Two size classes are recognized:

27. White fir-larch-Douglas fir, large: Forests where the majority of the volume is in dominant trees about 20 inches and more in d.b.h. (more than about 150 years old).

28. White fir-larch-Douglas fir, small: Forests where the majority of the dominant trees are about 20 inches in d.b.h. (less than about 150 years old).

White fir: Usually a mixed forest found in the range of ponderosa pine and sugar pine, consisting of 50 percent or more of Abies grandis or concolor.

29. White fir, large: Forests where most of the dominant trees are more than about 20 inches in d.b.h. (more than about 150 years old).

30. White fir, small: Forests where most of the dominant trees are less than about 20 inches in d.b.h. (less than about 150 years old).

31. Hardwood: A forest in which alder, maple, ash, cottonwood, myrtle, etc., predominate; pure or in mixture. (Does not include any oaks or madrone.)

32. Redwood: A forest containing approximately 80 percent or more of redwood, usually with some Douglas fir, madrone, tan oak, and other small hardwoods.

33. Subalpine: Forests at upper limits of tree growth, and usually unmerchantable because of poor form and small size. Its principal components, besides alpine fir, are mountain hemlock, Shasta red fir, lodgepole pine, whitebark pine, western white pine, and alpine larch.

35. Nonrestocked cutovers: In the original inventory type 35 was assigned to clear-cut areas logged prior to January 1, 1920, which were not restocked and which were not put to other use. In the "revision" inventory type 35a is assigned to clear-cut areas logged from January 1, 1920 to January 1, 1930, which are not restocked. Type 35b is assigned to clear-cut areas logged prior to January 1, 1920, which are not restocked.

36. Recent cutovers:

Original inventory - Clear-cut areas cut since January 1, 1920, regardless of status of regeneration.

Revision inventory - Clear-cut areas cut since January 1, 1930, regardless of status of regeneration.

37. Deforested burns: Lands not cut over on which the stand has been killed by fire, and which are not satisfactorily restocking. (Areas not restocking have less than 10 percent of the 13.2' x 13.2' squares stocked.)

38. Noncommercial rocky areas: Areas within the range of commercial timber and below the limits of the subalpine type which are too rocky, too steep, or too sterile, to produce a stand of commercial size, density, and quality. The timber may consist of any species, but is not, and is not likely to be of commercial value because of difficult logging conditions, low quality, poor form, and low volume. Ordinarily the stand averages less than 5,000 to 10,000 board feet per acre. No volume is recorded for this type. This type does not include the upper portion of valleys or the higher slopes of potentially loggable timber now inaccessible.